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# Towards International excavation tasks

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# Towards International excavation tasks


## Summary

Over the last twenty years social opposition to mineral excavation has increased to such an extent in the densely populated Netherlands, that it is getting extremely difficult to discover new sites for quarrying coarse sand for concrete. While the Dutch government has attempted for many years to shape more effective legislation covering mineral excavation, The Netherlands is yet importing ever growing quantities of building materials from abroad, especially from Germany and Belgium and currently from Scotland an Norway. It seems almost certain that in the future some restraints will be imposed on the import of minerals (unconsolidated deposits) from the populous areas in Germany and Belgium along the Rhine and the Meuse to The Netherlands.

Meanwhile, it is extremely difficult for the provinces of The Netherlands to come to an agreement over the location of new extracting sites. The theoretical model is inadequate and requires practical improvement. The directives based on this model, therefore, must be broadened to include larger contextual aspects.


## 1. Introduction

In The Netherlands there is an abundant amount of fine sand because The Netherlands is situated on the estuaries of the rivers Rhine, Meuse en Scheldt, where the finer sand is deposited. This finer sand is used for preparing building sites, sand for sand-limestone bricks, cellular concrete sand and asphalt sand. Besides, The Netherlands is lucky to have a number of - very small - sites where quartz sand can be extracted. The coarser kinds of sand, suitable for the production of cement concrete, only occur in some provinces in the central, the eastern an the southern parts of the country. In general this means that further upstream the overburden gets thinner and the layers where the coarser sand is stored are thicker.

Because, geologically seen, exploitable quantities of coarser sand only occur in certain parts of The Netherlands, the sand barren provinces need to get their supply of coarse sand from the provinces where coarse sand does occur. Consequently an inter-provincial distribution problem arises. In this context the expression 'regional shortage' is used. Since coarse sand is scarce in The Netherlands a lot of concrete sand is imported, particularly from Germany. In The Netherlands the annual consumption of concrete- and masonry sand is roughly 18 to 22 million tonnes, depending on the economic climate. The production in The Netherlands is at approximately the same level. About 8 to 10 million tonnes, particularly the finer types, are exported to Belgium. About 8 to 10 million tonnes, particularly the coarser varieties, are imported from Germany.

In figure 1 the coarse sand occurrences are shown. The zoning as included in the first Structural Outline Plan on Surface Minerals has already been considered. From 1996 on the government's policy on excavating is expressed in the Structural Outline Plan every other five years. In accordance with the Structural Outline Plan the next three zone-division must be considered when searching for new locations for quarrying (V&W and VROM, 1996, pg. 33):
- Zone 1: no quarrying in principle
- Zone 2: quarrying allowed under certain conditions
- Zone 3: quarrying allowed in principle

In the Structural Outline Plan the division of quarrying tasks among provinces, is amongst other things, also being discussed. The concept of excavation tasks has not been worked out clearly in the first Structural Outline Plan on Surface Minerals. On the one hand it has the status of 'agreements among provinces', on the other hand it is an 'imposed quarrying task'.

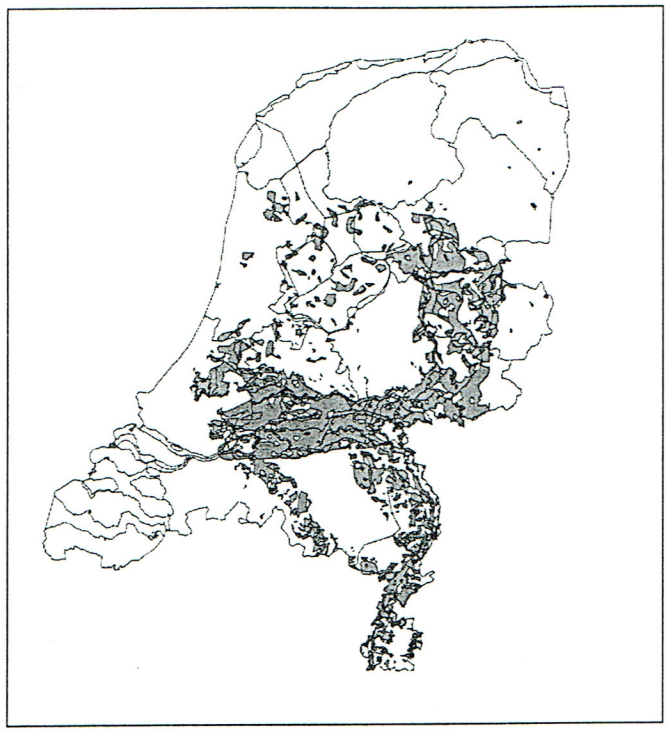

Figure 1

**Coarse sand occurrences where extraction is not ruled out (within zones 2 and 3)**

In the next section, first of all, a rough sketch is given of the procedure concerning the realisation of the provincial excavating tasks for concrete- and masonry sand. In The Netherlands provinces are the authorities that issue permits. For public waters the Minister of Transport, Public Works and Water Management (V&W) is the one who issues the permit. Subsequently in section three the current allocation model is discussed, used to establish a division of excavating tasks per province. Next in section four the shortcomings of the division model are listed. Subsequently in section five, the way excavating tasks are realised in practice is pursued in greater depth. In section six a plea is made in favour of a broader approach so as to enlarge the basis for the application of a division model. This is desperately needed because the division model only plays a marginal role in the negotiations on excavating tasks. Besides, interested parties can lodge an appeal against the extent and division of provincial quarrying tasks in the Structural Outline Plan. This contribution is rounded off with some concluding observations.

## 2. Procedures concerning the realisation of excavating tasks

The preparation and actual assessment of the height and division concerning the provincial excavation tasks for concrete- and masonry sand occurs in a limited sectoral 'arena', with respect to content as well as production management. After prognostications for the future national consumption have been formulated, an official technical preparation and assessment - within the National Commission for the co-ordination of mineral planning (LCCO) - takes place with respect to what will have to be made recoverable in view of the national consumption, and subsequently how it should be divided among the provinces. To do this a division model amongst other things, is employed. During consultations at managerial level between the Minister of Transport, Public Works and Water Management (V&W) and the provinces represented in the Inter-provincial Consultation Board, definite arrangements are made about what will have to be made recoverable over the next ten years. In the meantime two such decades are behind us: 1979-1988 and 1989-1998. The third decade 1999-2008 has meanwhile begun. Mostly halfway the term the excavation tasks are reviewed and adjusted if necessary.

The division of the production tasks among the 12 provinces and public waters has always been adjusted over the years. The public waters are in fact the 13th province in The Netherlands. The adjustments in the division are, on the one hand, due to improvements in the division model, on the other hand they are caused by the fact that the geological basic data are being kept up to date. Because of these changes several provinces that never had excavating tasks suddenly got one imposed on them. The province of South-Holland for example did not have excavation tasks imposed for the period of '79-'88. For the next decade, '89-'98, this province got an excavation task of 5 million tonnes (2.5% of the national quarrying quantity). At first the province of South-Holland accepted. In 1994 however, the province of South-Holland announced that it would adjourn reconfirmation of the agreements for '89-'98 and endorsement of the excavation tasks for '99-'08 in anticipation of a further investigation for alternative materials. Besides, in August 1996 the province of South-Holland lodged an appeal against the excavation tasks as mentioned in the Structural Outline Plan on Surface Minerals. The province appealed - on the grounds of article 2a paragraph 10 of the Physical Planning Act - against the excavating tasks for 1989-1998 as well as the preliminary excavation tasks for the period of 1999-2008. By then the 1989-1998 period had almost expired!

During consultations at managerial level between the Minister of Transport, Public Works and Water Management and the provinces at the end of 1997 it was agreed that the policy and the efforts to limit the concrete- and masonry sand quarrying inside the coast line - locations on land and public waters excluding the North Sea - had to be strengthened considerably. The objectives were and still are: a) more secondary aggregates, b) less from primary excavations and more from secondary excavations, c) the use of finer sand for concrete, d) maximising sand quarrying from the Dutch part of the North Sea, e) creating a basis for new concrete- and masonry sand quarries on land. It was also agreed that - as suggested by the province of South-Holland - a broadly based implementation plan for alternatives to quarrying concrete- and masonry sand would be drawn up, aimed at the goals mentioned above. In the meantime it seems that the excavation task - 5 million tonnes - forced on the province of South-Holland for 1989-1998 has died a slow death. It is estimated that in South-Holland a mere 0.5 million tonnes had been excavated during the period mentioned (LCCO, 1997, pg.6)

### 3. The current division model

To divide the quarrying tasks among the provinces a division model is used in principle. The current division model, which was developed in 1993 and improved in 1997, is based on various assumptions (LCCO, 1997, pg.13):

a) Firstly it is examined how much concrete- and masonry sand can be quarried from public waters (how much is possible and realistic).
b) Subsequently a certain amount of concrete- and masonry sand remains to be quarried, which must be divided among the provinces.
c) Each province contributes to a reasonable extent to their own consumption, taking the sand occurrences into account. In 1993 the point of view was still acclaimed that the provinces 'should meet their own demand as much as possible'. In 1997 this was toned down to 'contributes to a reasonable extent to their own demand'.
d) If provinces are not able to meet their own demand, the remaining demand for sand will be shipped from those provinces which have a surplus of sand, via the large number of water ways in The Netherlands.
e) The resulting concentrations of sand quarrying activities - sand quarrying concentrations - in sand-supplying provinces should not be larger than those in 'sand-importing provinces'.

In the division model it is assumed that the relative sand quarrying concentration and/or effort per province should not exceed - the still to be calculated - maximum $C_{max}$ (LCCO, 1997, encl. 3) In this way provinces with a comparatively large demand and limited quarrying possibilities will not be disproportionately burdened.

The first pillar the division model is based upon is the demand for concrete- and masonry sand by the various provinces. This division is based upon a periodic poll among producers and consumers of concrete- and masonry sand: Ready Mix plants, asphalt plants, the concrete ware industry and building contractors, see Table 1, column (a). In this division model it is assumed that provinces are self-sufficient by excavation tasks concerning 'the provinces own need', 'the remaining national need' and 'quarrying in state waterways'.

| Parts of the country | Own demand (%) | Own demand *1000 ton (10 years) | Surface total *100 ha | Surface by ship *100 ha | Task own demand (10 years) | Task remaining national demand (10 years) | Task total (10 years) | Concen-tration (ton/ha) (1 year) | % Model | % bar-gai-ning |
|---|---|---|---|---|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) |
| Groningen | 2,2 | 4.615 | 2 | 1 | 70 | - | 0 | 0 | 0,0 | 2,1 |
| Friesland | 4,9 | 10.280 | 2 | 0 | 70 | - | 0 | 0 | 0,0 | 0,0 |
| Drenthe | 3,2 | 6.713 | 65 | 19 | 2.275 | - | 2.275 | 35 | 1,2 | 2,4 |
| Overijssel | 7,4 | 15.524 | 692 | 256 | 15.521 | 3.218 | 18.735 | 27 | 8,8 | 8,6 |
| Flevoland | 1,2 | 2.517 | 103 | 44 | 2.516 | 465 | 2.977 | 29 | 1,4 | 0,9 |
| Gelderland | 14,8 | 31.049 | 2.132 | 1452 | 31.042 | 29.679 | 60.723 | 28 | 28,8 | 34,7 |
| Utrecht | 5,5 | 11.538 | 207 | 139 | 7.245 | - | 7.245 | 35 | 3,3 | 2,9 |
| North-Holland | 10,4 | 21.818 | 83 | 36 | 2.905 | - | 2.905 | 35 | 1,4 | 0,9 |
| South-Holland | 18,4 | 38.601 | 426 | 319 | 14.910 | - | 14.910 | 35 | 7,1 | 5,0 |
| Sealand | 2,7 | 5.664 | - | - | - | - | - | - | 0,0 | 0,0 |
| North-Brabant | 19,0 | 39.860 | 1.241 | 672 | 39.861 | 1.935 | 41.796 | 34 | 20,0 | 12,4 |
| Limburg | 10,4 | 21.818 | 932 | 565 | 21.818 | 6.548 | 28.366 | 30 | 13,6 | 15,9 |
| Public waters | - | - | - | - | - | 30.000 | 30.000 | - | 14,3 | 15,9 |
| Total | 100,0 | 210.000 | 5.885 | 3.502 | 138.233 | 71.845 | 210.078 | | 100,0 | 100,0 |

(a) Based on the consumption during the years 1988 up to and including 1993. Source: LCCO,1997
Please note: In column (c) and (d) a geological weighing factor is used.

Table 1 **Calculated divisions (%) and setting of tasks for concrete- and masonry sand based on the division model, taking into account that 210 million tonnes have to be quarried.**

The second pillar the division model is based upon concerns the surface area for exploitable sand quarrying occurrences. Zoning, as in the first Structural Outline Plan on Surface Minerals, is the starting point for assessing the surface of the areas where in principle excavating is possible, see Table 1, column (c). Additionally a geological weighing factor is handled. By means of this weighing factor the fact that in general the overburdens in the northern and western parts of The Netherlands are thicker and the sand on an average is less coarse, have been taken into account. The factors have been assessed by experts on the basis of their experiences. Meanwhile the green light has been given to start research into an improved foundation of the weighing factor. As a consequence of the introduction in 1997 of the weighing factor the provincial division of excavation tasks in terms of percentages changed considerably. The contribution of South-Holland for example decreased from 12% to 7.1%, see column (i) in Table 1. There is still a great deal of uncertainty in the weighing factors, which probably causes a considerable 'interference' in the final excavation tasks.

In Table 1 the model has been worked out taking into account that 210 million tonnes have to be quarried over a 10-year period. It was assumed that 30 million tonnes could be quarried from public waterways, see line 'Public waterways' columns (f) and (g) in Table 1. The calculations proceed as follows. Firstly the relative sand-quarry concentration is calculated as the quotient of the own demand per province and the total surface

area per province. If the quotient exceeds the still to be calculated maximum $C_{max}$, this maximum is kept. $C_{max}$ is calculated through iteration and in this example it's an annual 35 tonnes/hectare. The demand that cannot be met by quarrying in the province itself - the so-called remaining national demand T(rnd) - is divided among those provinces that produce more than they need. This distribution code is based upon the - weighed - surface areas of concrete- and masonry sand occurrences in those provinces situated within five kilometres of the axis of the main waterways, see column (d), Table 1. Secondly the distribution code is based on the extent in which the relative sand quarrying concentration remains below $C_{max}$. This 'remaining' sand quarrying effort is multiplied by the - weighed - surface area of main waterways - to calculate the excavation tasks 'remaining national demand' T(rnd), see column (f) in Table 1. A province total excavating task is the sum of the excavating tasks to meet their own demand T(od) and that of the remaining national demand T(rnd), see columns (e) and (f) in Table 1. Column (i) in Table 1 shows the division in terms of percentages if quarrying in public waterways is considered too.

## 4. Shortcomings in the division model

The division model supplies the provinces' demand by means of an 'excavation task own demand' T(od) and an ' excavation task remaining national demand' T(rnd). The angle of incidence chosen is rather abstract. It suggests that there is no export at all. The reality is that the Dutch demand is supplied by the production for the benefit at home and the import. In addition sand is produced for export. The excavation tasks calculated also suggest that there is no excavation task for export. Part of the total sum as for what has to be quarried is allocated for export, see column (g) in Table 1.

If the calculations are run over it appears that by way of the division model part of the export is divided on the basis of the division of the consumption throughout The Netherlands. The greater the domestic demand of a province the greater the part of the export. This is valid for those provinces of which the $C_{max}$ is not exceeded and to a limited extent for those provinces the certain maximum relative concentration is reached (as a consequence of the $C_{max}$ limitation). The question that could be put forward is whether this part of the export really can be divided in this way. The province of South-Holland on the westcoast of The Netherlands for instance does have a very large domestic demand because of which according to the underlying distribution codes of the calculation model the part to be exported as mentioned above will be relatively large. South-Holland is, however, in view of its position, the least obvious province for exporting. The model ignores the question from what province the export is to come.

If the notion 'excavation task for domestic demand' T(od) would be taken literally it appears that the calculated T(od) turns out to be higher than the actually needed production for the whole country. An extra constraint should be built in through which the T(od) equals the production for the whole country. In that case it should also be indicated what part of quarrying from public waterways is meant for domestic consumption. By calculating in this way in all cases, $C_{max}$ in the division model is reached in areas positioned on main waterways.

Uncertainties as described above concerning the concrete- and masonry sand flows raise the question whether concrete- and masonry sand flows on a provincial scale, shouldn't be looked at in greater depth. From various studies it appears that it is possible to map the import and export flows between a certain province and the rest of The Netherlands and the import and export flows from and to foreign countries. The way of transport can also be made visible (OOM/RUG, 1994, pg. 34 and 35 and the province of Limburg, 1998, pg. 52). Table 2 shows the actual concrete- and masonry sand flows. When comparing the actual figures with the figures of the division model for concrete- and masonry sand flows on a provincial level the picture is quite different and much more complex by taking into account the supply and distribution from and to the rest of The Netherlands and the import and export from and to foreign countries. If we want to get a clearer picture of the concrete- and masonry sand flows in The Netherlands sand balances as in Table 2 should be drafted for all provinces and public waterways. Furthermore, within those flows one could

distinguish between quarrying along main waterways and quarrying not along main waterways. The public waterways only provide for export to foreign countries and supply to the rest of The Netherlands. In the division model in Table 1 the production in The Netherlands is central. If supply per province is central then the distribution of the import from abroad over The Netherlands, and the distribution of the supply from the rest of The Netherlands, are important.

Built on the principle which is fundamental to the division model, many different derivative models could be developed. For instance more emphasis could be laid upon the principle that every province should be self supporting as much as possible through quarrying in areas which aren't positioned alongside main waterways. The own demand could be initially obtained only from areas not along main waterways.

| Parts of the country | Consumption in the province | Production for own demand | | Production for foreign countries | | Production for inter-provincial supplies | | Import from foreign countries | | Import from other provinces | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nmw | mw | nmw | mw | nmw | mw | nmw | mw | nmw | mw |
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| Province 01 | C01 | y | y | x | x | u | u | m | m | i | i |
| . | . | . | . | . | . | . | . | . | . | . | . |
| . | . | . | . | . | . | . | . | . | . | | |
| Province 12 | C12 | y | y | x | x | u | u | m | m | i | I |
| Public waters | - | - | - | - | x | - | u | - | - | - | - |
| Total | | Yn | Yw | Xn | Xw | Un | Uw | Mn | Mw | In | Iw |

- = not applicable.
y = for own demand.
nmw = not along main waterways.
mw = along main waterways.
C = Consumption in the province regarded.
m = import from foreign countries.
x = export to foreign countries.
i = inter-provincial supply (import).
u = inter-provincial supply (export).

Table 2 **A concrete- and masonry sand balance for all provinces and public waterways.**

In the final excavation-task tables which are in use with the mineral planning policy, no distinction is made between an excavation task for self sufficiency and an excavation task for the remaining national supply per province. Neither is there a distinction between excavation tasks along main waterways and a excavation tasks not along main waterways per province. An explicit excavation task for areas along main waterways seems, however, important to secure the supply of areas which cannot be self sufficient, due to geological reasons. The provinces could execute a policy implying to leave the supply to foreign countries.

Due to the fact that the division model reflects only part of the reality, it is hardly possible to make the actual criteria used more explicit. Therefore for instance no statement can be made upon the fact whether the export is fairly distributed among those provinces where areas are positioned on main waterways. It is also difficult for instance to say whether the import is efficiently and/or fairly distributed over The Netherlands.

### 5. Division in practice

To keep the pressure on the kettle for the application of alternative materials the Minister of Transport, Public works and Water Management and the Inter-provincial Consultation Board at the end of 1997 agreed on the assumption of 170 million tonnes for the task setting period from 1999 till 2008. By doing so they were 20%

down on the prognosis. When foreign countries keep supplying concrete sand it is expected that the pressure on using more secondary and alternative materials will hardly increase, as long as no subsidies are granted and/or levies are imposed. Logically imports will first increase until the foreign countries start 'squealing'. It remains to be seen if this is going to happen within the task-setting period mentioned. The countries surrounding The Netherlands are many times bigger. As a consequence the export flows to The Netherlands are experienced as less quickly aggravating.

Depending on the moment the excavation tasks agreed upon are either incorporated in the Structural Outline Plan on Surface Minerals as a decision of major importance or they are for example sent on to the Lower House in the form of a joint letter by the Minister of Transport, Public Works and Water Management and the Minister for Housing, Physical Planning and the Environment [1]. Between the two ways there is a large difference as to the judicial consequence for the parties concerned. In the former case the procedure for a National Planning Key decision (PKB) for the Structural Outline Plan on Surface Minerals must be run through, in which there is a moment of participation and a moment of appeal (for essential decisions). In the latter case the parties concerned can only exert their influence through unofficial ways - lobbying MPs. With parties concerned who are not only indirectly involved in the process, this will evoke the image of back room dealings [2]. Particularly the point that the excavation tasks concerned are not incorporated in the Structural Outline Plan on Surface Minerals makes it from a practical point of view impossible for the Minister of Housing, Physical Planning and the Environment to give a so-called directive, should a province be uncooperative.

The theoretical results of the division model are only partly used in policies. The calculating model seems to function as a frame of reference. For most provinces the excavation tasks are specified on practical grounds. It has been looked at how much sand can be quarried from certain projects, when certain new quarries will be started up, what is going to be produced in old extraction pits on the basis of old concessions, etc., etc. The actual assessment on the final (re-)distribution of excavation tasks took place in 1988 in a 'back room' of the Inter-provincial Consultative Board [3]. The drafted division hardly played a role in it, see columns (i) and (f) in Table 1.

## 6. Towards a broader approach

The planning system as has been laid down in the amended Mineral Planning Act 1996 reflects in principle the official divisions of power within the government in the field of mineral planning. As far as this the government is able to develop relatively much power and could, if necessary, enforce the extraction of surface minerals, anyway that has been the intention of the change to the Dutch Mineral Planning Act in 1996. So far the government has been very careful in dealing with enforcing measures. One of the reasons for this is that in the course of years a culture has developed in which the government has become considerably dependent on co-operation of the provinces. This resulted directly from the fact that in the initial Mineral Planning Act of 1965 no directive and co-ordinating role for the central government was claimed.

A second important reason why the government could afford to be careful in enforcing measures is that the foreign countries could - and still want to - supply our country to a considerable extent with surface minerals. The Netherlands is a relatively small country and requires a relatively small amount of surface minerals. The export to The Netherlands particularly from Belgium and Germany is not yet on the political agenda of those countries. This is one of the reasons why the government could endorse the creation of a manageable scarcity for concrete- an masonry sand and a by the province of Limburg advocated run-down in gravel and limestone quarrying in The Netherlands. A third supposed reason which has led to prudence is that the central government itself doubts the foundations of the policy, particularly as far as the division of the excavation tasks for concrete- and masonry sand are concerned.

A fourth supposed reason for prudence from the government's side are judicial doubts about the possibility of enforcing an allocation for a so-called 'quarrying location' within the provincial Regional Plan by the Minister of Housing, Physical Planning and Environment on the basis of the Physical Planning Act [5]. It particularly concerns the fact that in the Structural Outline Plan on Surface Minerals quantitative guidelines are stated on the amounts to be quarried without making a physical plan. With the excavating tasks formulated for the period 1989-1998 and 1999-2008 no spatial allocations have been connected in the form of quarrying zones. The first Structural Outline Plan on Surface Minerals does mention searching areas as in zones 2 and 3. This resulted, however, in such large exploring areas which, therefore, cannot be labelled as physical allocations. In the explanatory statement to the amendment of the Mineral Planning Act of 1996 it is assumed, actually, that in accordance with the Physical Planning Act, there cannot be an allocation unless the Structural Outline Plan contains a physical allocation. The final division of the excavating tasks for concrete- and masonry sand has been established pragmatically, as already explained before. It is hard to imagine that the Minister of Housing, Physical Planning and the Environment would like to decide on allocations in respect of the contents of a provincial Regional Plan on the basis of such an approach. If the government really wants to have the big stick, the spatial component should be worked out in much further detail. A fifth reason - especially for concrete- and masonry sand - was that nationally seen there was no problem, because the excavation tasks were reached through some extra efforts from other provinces.

From a legal protection and democratic decision making point of view it would be advisable to integrate the excavating tasks in the Structural Outline Plan on Surface Minerals and if decisions are regarded as essentially important. Besides, it would be advisable to start working with 'task periods' that correspond with the period of validity of the Structural Outline Plan on Surface Minerals, which is 5 years. By doing so definite excavating tasks can always be brought about in the Structural Outline Plan on Surface Minerals, at least that is what we should be striving for.

The government's policy concerning the supply of raw materials for the building industry is aimed at meeting the demand of private persons, companies and the authorities for building materials in a socially responsible way (V&W and VROM, 1996). By providing a democratic and just decision-making policy, appropriate decisions and decisions aimed at a sustainable development, the government could guarantee this. By means of the mentioned concepts the notion 'in a socially responsible way' can be given flesh and blood. As regards to the protection by law the decision on the excavation tasks should be well-founded.

One of the ways to get to a substantially improved approach is to strengthen and/or broaden the foundations of the current division model for concrete- and masonry sand. This can be done 'for example' by involving, next to geological aspects, for example the environmental aspects, spatial aspects, economic aspects, international aspects, etc. These aspects could be looked upon from the angle of sustainability, justice and efficiency.

As for the division of quarrying tasks for concrete- and masonry sand muddling on in the same way is not to be recommended. To come to definite decisions on the division of quarrying tasks the authorities cannot make up their mind or are always much too late. The moment one should make up one's mind provinces concerned will always be inclined to keep the pressure on by asking for instance an additional investigation. By considering and weighing the issue as being a more integral part - unfortunately integral is often disposed of as fashionable - the provinces will be left with substantially more scope for negotiating the issue. Moreover, compensation could be offered for instance. It's much simpler to discuss one issue, e.g. the amounts of concrete- and masonry sand to be quarried. By doing so, eventually a broader basis could be created for a possible directive in accordance with the Physical Planning Act.

Suppose an allocation cannot be given without a spatially weighed allocation is specified one way or the other. What would this mean? This would mean that if in the Structural Outline Plan on Surface Minerals a directive on a provincial excavation task is imposed, the related weighed spatial reservation for an allocation

should already be worked out. Investigations into this matter should be started off in time and be ready. The underlying document - which for instance could be called an 'integral physical quarrying division plan' - from which it should be clear what considerations have led to it, must bear sufficient status and basis to serve as a foundation for a directive in accordance with article 6 of the Physical Planning Act. An additional contrastive positive effect is that the necessity of issueing allocations will decrease as foundations are better.

With regard to the environmental aspects it is to be concluded that for many matters of policy an EIS-statement is desirable at a strategic level as well as at a location and/or executional level. At a strategic level various different EISs have been executed, as there was an EIA as part of the Structural Outline Plan on the Supply of Electricity and two EIAs as part of the Structural Outline Plan on Rural Areas and the Ten-year-Programme on Waste Disposal.

The Structural Outline Plan on Surface Minerals is a so-called National Planning Key-decision. Planning Key-decisions in accordance with article 3 of the EIA Decree should run through the EIA procedure if these plans involve decision making procedures on main features like the choice of an excavation site. With such an EIS 'the alternatives for quarrying' should have the same status as the 'excavation activity'. Since all questions are still open an EIA-policy for the concrete- and masonry sand supply seems necessary to support strategic choices in the field concrete- and masonry sand supply. It will also become clear what deficiencies in knowledge there still are. Primary excavation of concrete- and masonry sand on land could always be the central verification point.

With a new integral spatial task-division plan, an external independent examination by a 'commission of independent experts' seems recommendable not only to guarantee the quality concerning the content, but also to enlarge the basis for similar situations. In the past more than once suggestions were made and experiments were carried out in the form of a 'procedure guidance commission' (WRR,1994). The Commission's task was to steer and test the study.

## 7. Concluding observations

In order to come to - latent - physical reservations at a national level, to support allocations one could go the way of evaluating potential quarrying areas at a national level. It seems better to incorporate a spatial model in an integral physical task-division plan for quarrying tasks regarding concrete- and masonry sand. Then spatial reservations can be compared at the level of the Structural Outline Plan. By doing so three issues could coincide:

1) A real improvement of the current sectoral task-division model as far as the actual flows are concerned.
2) Making the sectoral division model more integral by adding further criteria, connected to the items sustainability, efficiency and justice.
3) Drawing up a 'real' EIS on concrete- and masonry sand supply at national level - tested by the Commission for the environmental impact statement - the parts of which could be worked out further within an integral spatial task-division scheme.

Ad 1) For this a sand-balance matrix in conformity with Table 2 could serve as a basis. On that basis a quarrying task regarding self-sufficiency, one regarding inter-provincial distribution and one regarding export could be generated. Besides one would get an insight as to how every province is going to meet its demand by means of imports and by supplies from other provinces. From the angle of justice it would be desirable to weigh the various flows in different ways [6]. The current system which imposes only one unspecified quarrying task on provinces offers space for manipulation because then it's not clear what part should come from main public water areas. The same goes for the production from secondary excavations. These could be considered separately. Until now there is no sound definition of the notion 'secondary excavation'. This will be necessary if from a policy point of view a certain meaning or certain weight is attached to it.

Ad 2) The sectoral inter-provincial division model should be considered a more integrated part by including further criteria in the considerations. Apart from the geological data also for example environmental aspects, spatial aspects, economic aspects, international aspects, etc. should also be considered. The aspects mentioned can be looked upon from a sustainability, justice and efficiency point of view. Since there are so many questions which are still open a real EIA-policy for the concrete- and masonry sand supply seems necessary to support the strategic choices at a national level in the field of the concrete- and masonry sand supply. Parts of it, as already said, can be worked out in an integral physical task-division plan. The approach pursued so far concerning the realisation of the division of quarrying tasks for concrete- and masonry sand has practically all the features of a half-open planning procedure [7]. As for other further policy areas the Dutch authorities are changing towards a more interactive open planning procedure (V&W, 1998). The most important result will be the creation of a larger basis for making decisions. Other advantages such as a shortening of the time schedule, a reduction in the costs or achieving a win-win-result seem to be rather a disappointment until now (Woltjer, 1998). When changing to a more interactive open decision-making process one can't escape the fact that for proposals leading to a division of quarrying tasks the foundation should be broadened. Interactive processes are also considered a condition for reaching integral solutions.

Ad 3) It is important that during an EIA-procedure in principle every alternative for primary concrete- and masonry sand quarrying must be held against the light, taking into account that particularly the spatial component should be studied in greater depth. Major obstacles with regard to the concrete- and masonry sand supply are after all lack of space due to primary excavation and - as a result of lakes - the subsequent change of the geographical structure. Much research is still necessary in this field. It is also to be expected that as a result of further research opinions will shift. The 'magic potion' of life-cycle analysis (LCAs) knows quite some restrictions, particularly when they are about changes in the scenery at local level. An EIA gives something to go on as far as this is concerned. The uncertainties mentioned make it difficult to adept a rigorous policy on excavating.

In The Netherlands traditionally much sand and gravel is excavated in wet areas. There are, however, substantial surface areas which are situated higher where sand and gravel can be excavated from dry quarries and where usable land remains after excavations. This fact should be taken into account more explicitly as a criteria when searching for new excavation areas in The Netherlands.

In the future the international dimension in the supply of surface minerals will become more and more important for The Netherlands. It concerns limestone, gravel and the coarser concrete sand in particular. In order to be able to assess how many minerals The Netherlands will have to import, it is important to have correct prognoses for the consumption of the minerals mentioned. Besides, it is important to monitor excavation policies of the countries likely to supply. It looks as if in Europe a process at an international scale is in progress, in the course of which more surface minerals from thinly populated areas are exported to densely populated areas. It remains to be seen if this is desirable from a sustainability point of view - distance of transport. Besides, in densely populated areas more and more secondary aggregates become available because of demolition of built on areas.

It may be expected that division problems at an international level will also arise in densely populated areas in Europe when it comes to allocating excavation tasks. From experience gained concerning the division of quarrying tasks in The Netherlands, the conclusion can be drawn that an approach of just regarding the surface of geological reserves and the consumption per area considered, does not satisfy and will lead to problems. A broader approach as described above concerning the Dutch situation could also be tailored to division problems at an international level.

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## Notes

[1] See for instance Lower Chamber, 1997-1998, 23625, nr.19.

[2] The proposal to lower the total national excavation task from 210 to 170 million tonnes - a 20% decrease - for the period of 1999-2008 brought forward by the Inter-provincial Consultation Board quite a late stage of the decision making process, without consultation with other interested parties. The aim is to increase the use of alternatives in respect of primary concrete- and masonry sand quarrying inside the coast line. The 20% decrease was numerically ill-founded and is actually based on the trail-and-error-method: 'If we don't achieve then we will readjust the quarrying tasks'. The 20% decrease will mainly have to be realised by new excavations, because it is difficult to break into existing licences.

[3] In 1998 the Inter-provincial Consultation Board didn't found the excavation tasks any further with an amplifying document. The division didn't correspond with the initial LCCO-proposals.

[5] The amendment in the Mineral Planning Act in 1996 offers provinces the possibility to incorporate a so-called 'excavation area'. They are as accurate as a municipal Land-use Plan. For citizens there is no more possibility to lodge an appeal against the usefulness and necessity of such an excavation area.

[6] The order of weighing 'most desirable' to 'most painful' that could be incorporated in the models could be as follows: 1) secondary production, 2) production to meet the own demand, 3) production for inter-provincial supplies and 4) production for foreign countries.

[7] In a 'semi-open process' the body that has the right to decide - e.g. the Ministry of Transport, Public Works and Water Management - to co-operate closely with other parties - mostly other authorities - that are closely involved, concerning content and/or decision-making, in the matter. From ones own perception on the issue and from ones own interest one works together on the policy issue. The collaborating parties are in this situation for instance engaged in a project organisation. (Technical) scientific institutions can participate as advisors or through a sounding board. Citizens and organised interest groups are mostly just informed. In an 'open planning process' interest groups and/or citizens play an active role in the policy making process. They participate in defining the issue and express their opinion on the solutions brought up. This doesn't necessarily mean that they are engaged in the project organisation. Their input is often organised in workshops (Ministry of Transport, Public Works and Water Management, 1998b).